



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,423	09/29/2000	Vadakkadathu T. Rajan	YOR920000464US1	5709

33233 7590 02/02/2004

LAW OFFICE OF CHARLES W. PETERSON, JR.
P.O. BOX 710627
OAK HILL, VA 20171

EXAMINER

ALI, SYED J

ART UNIT PAPER NUMBER

2127

DATE MAILED: 02/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/676,423

Applicant(s)

RAJAN ET AL.

Examiner

Syed J Ali

Art Unit

2127

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-27 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 5, 8 and 10 are objected to because of the following informalities:

As per claim 5, in line 3, "merging nodes at opposite end" should read "merging nodes at opposite ends".

As per claim 8, there is no period at the end of the claim.

As per claim 10, in lines 1, "A task management method as in claim 6 wherein" should read "A task management method as in claim 6, wherein".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt (USPN 6,629,123) in view of Ibe et al. (USPN 6,437,04) (hereinafter Ibe).

As per claim 1, Hunt discloses a task management method for determining optimal placement of task components, said method comprising:

- a) generating a communication graph representative of a task (col. 23 lines 13-23, "the application units and inter-unit communication form a commodity flow network", wherein the application units are components of a task or an application program, and the inter-unit communication provides information pertaining to the weighting of edges), task components represented as nodes of said communication graph (col. 24 lines 8-28, "Create one node for each unit in the applications") and edges connecting ones of said nodes, said edges representing communication between connected nodes and being weighted proportional to communication between connected nodes (col. 24 lines 8-28, "Create one edge between every pair of communication units. The weight on the edge should be the difference between communication cost [communication time] for the remote case [when two application units are placed on separate machines] and the local case [when the two application units are placed on the same machine]");
- c) identifying high communication edges within said communication graph, said high communication edges having a weight indicating a communication level exceeding the communication level for a selected node (col. 24 lines 8-28, "For each application unit that must reside on the client-for instance, because it directly accesses GUI functions-create an edge with infinite weight from the source to the application unit. For each application unit that must reside on the server-because

Art Unit: 2127

it directly accesses storage-create an edge with infinite weight between the sink and the application unit”);

d) determining a min cut solution for said communication graph, high communication edges being excluded from determined min cut solutions (col. 24 lines 8-28, “the algorithm to map a client-server distributed partitioning problem onto the MIN-CUT problem is as follows”, “Since the minimum cut contains edges with the smallest weights [capacities], those edges represent the line of minimum communication between the client and server”); and

e) placing task components on said terminal nodes responsive to said min cut solution (col. 23 lines 13-23, “After all data has been gathered, it is the optimization algorithm that decides where application units will be placed on the network”, wherein the optimization algorithm is a minimum cut algorithm and finds the paths of minimal communication costs).

Ibe discloses the following limitations not shown by Hunt, specifically:

b) assigning terminal nodes to said communication graph (col. 5 line 64 - col. 6 line 3, “Shaded nodes 3, 6, and 10 are anchor nodes”, wherein an anchor node is analogous to the claimed terminal nodes in both form and function).

It would have been obvious to one of ordinary skill in the art to combine Hunt with Ibe since in cases where a particular task is large, the time required to generate a minimum cost cut of the graph may prove to be prohibitively high. Thus, to modify Hunt with Ibe would have been obvious in order to calculate minimum costs for smaller graphs, while maintaining data dependencies between the sub-graphs, such that all communication links are still intact.

As per claim 2, Ibe discloses the following limitations not shown by Hunt, specifically, a task management method as in claim 1, after the step (b) of assigning terminal nodes, further comprising the step of:

b1) identifying independent nets in said communication graph, each of said independent nets being connected between a plurality of said terminal nodes (col. 8 line 31 - col. 9 line 24, "One embodiment of a method of automatically partitioning a graph may generally be described with reference to Fig. 3A, the individual steps being discussed in greater detail below. In this embodiment, the presence of anchor nodes makes it unnecessary to construct clusters in an arbitrary manner").

Allowable Subject Matter

4. Claims 3-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Claims 11-27 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

Although numerous techniques exist for determining minimum cut - maximum flow representation of a task communication graph, as well as assigning weights to the

Art Unit: 2127

edges connecting nodes of the graphs, a method of collapsing edges in a communication graph in accordance with claim 3 is not disclosed or fairly suggested by the prior art. For instance, the above referenced combination of Hunt and Ibe discloses a way of identifying a minimum cut solution for a graph by eliminating high communication edges. This allows faster communication from node to node by eliminating communication paths that are unsatisfactorily slow. However, neither Hunt nor Ibe disclose collapsing edges based on an algorithm as in dependent claim 3, and no additional references were found that disclose a method of collapsing edges in the manner of, or similar to, claim 3. Therefore, claim 3 would be allowable if rewritten as an independent claim, containing all of the limitations of claims 1-2 as well. Furthermore, claims 4-10 are dependent on claim 3, and would therefore be allowable for at least the same reasons as discussed for claim 3.

Independent claims 11 and 19 recite similar limitations as those in claim 3 pertaining to the collapsing of selected edges according to a summation and comparison technique. These claims are allowable for similar reasons as discussed above for dependent claim 3, as the prior art does not disclose or fairly suggest the summation and comparison technique used to collapse edges. Dependent claims 12-18 and 20-27 are allowable for at least the same reasons as discussed for independent claims 11 and 19, respectively.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2127

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A Grant can be reached on (703) 308-1108. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



Syed Ali
December 8, 2003



MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100